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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/897,576	07/02/2001	Richard J. Markle	2000.071100	1249

23720 7590 01/29/2003

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EXAMINER

NGUYEN, SANG H

ART UNIT	PAPER NUMBER
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2877

DATE MAILED: 01/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Examiner	Applicant(s)
	Sang H Nguyen	MARKLE ET AL

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 18 November 2002.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-65 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-65 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f)
- a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary, PTO-413, Paper No. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>2 & 3</u> | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321© may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-65 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-59 of copending Application No. 09/897,623 filed on 07/02/01. Although the conflicting claims are not identical,

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they are not patentably distinct from each other because all of elements in apparatus and method claims 1-65 are inherent in apparatus and method claims 1-59 of copending Applications No.09/897,576, for example, the limitations in claims 1, 13, 23, 33, 40, 50, 51-52, and 63 are similar to limitations in claims 1, 13, 23, 33, 40, 50, 51-52, and 57 of copending Application No. 09/897,623.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 52-62 are rejected under 35 U.S.C. 102(b) as being anticipated by Armacost et al (U.S. Patent No. 6,489,005).

Regarding claims 52-62; Armacost et al discloses a test structure of a wafer (10,12 of figure 1) comprising a plurality of trenches/lines (30 of figure 3C), a plurality of columns/contact openings (14 of figure 3H and 14 of figure 2) defined the trenches/lines (30 of figures 3C-3II), wherein the trenches/lines (30 of figure 3C) being defined in a base layer (18 of figures 3), and the contact openings/columns (14 of figure 2) in one trench/line (30 of figure 3C) are aligned

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with the contact openings/columns in an adjacent trench (figure 3C), wherein the base layer (18 of figure 3) having at least one of a photoresist layer, a substrate layer, an insulative layer, and a conductive layer (col.2 lines 25-48; and col.4 line 61 to col.5 line 26). See figure 1-8.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-51 and 63-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lensing (U.S. Patent No. 6,464,563) in view of Liu (U.S. Patent No. 5,736,863).

Regarding claims 1-2, 7-13, 18-23, 28-44, 47-51, and 63-65; Lensing discloses a method and a metrology tool determining column/ process layer dimensions, comprising:

* a wafer (205 of figure 2) having test grating (400 of figure 4) including a line considered to be trench (320 of figure 3A and col.5 line 25) and contact layer is consider to be a process layer (360 of figure 3A or 410 of figure 4) formed in the line or trench (320 of figure 3A);

* a light source (222 of figure 4) for illuminating at least at least one portion of the columns (410 of figure 4);

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* a detector (224 of figure 4) for detecting light reflected from the illuminated portion of the contact opening/process layer (410 of figure 4) to generate a reflection profile;

* the data processing unit (225 of figure 4) for comparing the generated reflection profile to a library of reference reflection profiles, each reference reflection profile having an contact opening dimension metric, selected a reference reflection profile closest to generated reflection profile, and determining a dimension of the contact opening/process layer (410 of figure 4) based on the reflection profile (see claims 1, 10, and 20). See figures 1-6.

Lensing is shown to teach all of features in claimed invention except for the test structure having a plurality of contact openings defining in a plurality of the trenches/lines. However, Liu teaches that it is known in the art to provide a wafer (10 of figure 7) having a test structure (figure 3 and col.4 lines 39-42), wherein the test structure (figure 3) comprises a plurality of contact openings (L,M,N, O of figure 7) forming a conductive material (16 of figure 4B) in the trenches/lines (L, M, N, O of figure 7). See figures 1-5 and 7-10.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a method and a metrology tool determining column/ process layer dimensions of Lensing with test structure having a plurality of contact openings defining in a plurality of the trencheslines as shown in the method and device of Liu for the purpose of accurate measurement of features or dimensions of the material filling in contact holes.

Regarding claims 3-6, 14-17, 24-27, and 45-46: Lensing is show to teaches all of the features in claimed invention except for determining at least one parameter of the operating of

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the etch tool comprising at least one etch time parameter, a plasma chemical composition parameter, and an end-point signal parameter; and determining of photolithography tool comprises at least one of an exposure time parameter, an exposure dose parameter, a depth of focus parameter, resist spin speed parameter, and focus tilt parameter. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide method and metrology tool determining column/ process layer dimensions of Lensing with determining at least one parameter of the operating of the etch tool comprising at least one etch time parameter, a plasma chemical composition parameter, and an end-point signal parameter; and determining of photolithography tool comprises at least one of an exposure time parameter, an exposure dose parameter, a depth of focus parameter, resist spin speed parameter, and focus tilt parameter for the purpose of matter of design choice, since it has been held that rearranging parts of invention involves only routine skill in the art. In re Japikse, 86 USPQ 70.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Miller et al (6,259,521) discloses method and apparatus for controlling photolithography parameters based on photoresist image; Miethke et al (6,486,036) discloses method and apparatus for process control of alignment in dual damascene processes; Sandhu (6,436,247) discloses collimated sputter deposition monitor using sheet resistance; Cresswell et al (5,920,067) discloses monocrystalline test and reference structures and use for calibrating

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instruments; Madson et al (6,391,699) discloses method and manufacturing a trench mosfet using selective growth epitaxy; Li et al (6,327,035) discloses method and apparatus for optically examining miniature patterns; or Gregory et al (6,316,276) discloses apparatus and method of planarizing a semiconductor wafer .

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Sang Nguyen whose telephone number (703)308-6426. The examiner can normally be reached on Monday through Friday from 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Frank Font, can be reached on (703)308-4881. The fax phone number for the organization where this application or proceeding is assigned is (703)308-7722 or 7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

SN
Nguyen/ sn

January 16, 2003

F.G.F.
Frank G. Font
Supervisory Patent Examiner
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